

Introduction

References and Presentation at:
http://www.elinux.org/Open_tools

Introduction

- Dave Anders aka prpplague

Introduction

- Dave Anders aka prpplague
- Employed at Intel as part of OTC/MinnowBoard

Introduction

- Dave Anders aka prpplague
- Employed at Intel as part of OTC/MinnowBoard
- Creating Open Hardware Tools

Introduction

- Dave Anders aka prpplague
- Employed at Intel as part of OTC/MinnowBoard
- Creating Open Hardware Tools
 - Background and History (Past)

Introduction

- Dave Anders aka prpplague
- Employed at Intel as part of OTC/MinnowBoard
- Creating Open Hardware Tools
 - Background and History (Past)
 - Creating new tools (Present)

Introduction

- Dave Anders aka prpplague
- Employed at Intel as part of OTC/MinnowBoard
- Creating Open Hardware Tools
 - Background and History (Past)
 - Creating new tools (Present)
 - Challenges going forward (Future)

Open Tools History

- Open Tools in Science

Open Tools History

- Open Tools in Science
 - Experiments often require special tools

Open Tools History

- Open Tools in Science
 - Experiments often require special tools
 - New tools are shared with other scientists

Open Tools History

- Open Tools in Science
 - Experiments often require special tools
 - New tools are shared with other scientists
 - Robert Bunsen - Bunsen Burner

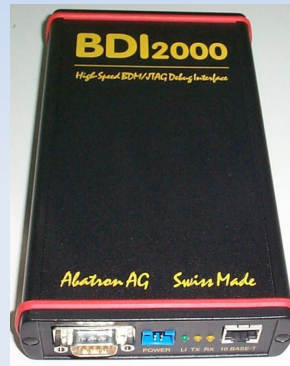


Open Tools History

- Open Tools in Science
- Commercial Solutions

Open Tools History

- Open Tools in Science
- Commercial Solutions



Open Tools History

- Open Tools in Science
- Commercial Solutions
 - Limited Operating Systems Supported

Open Tools History

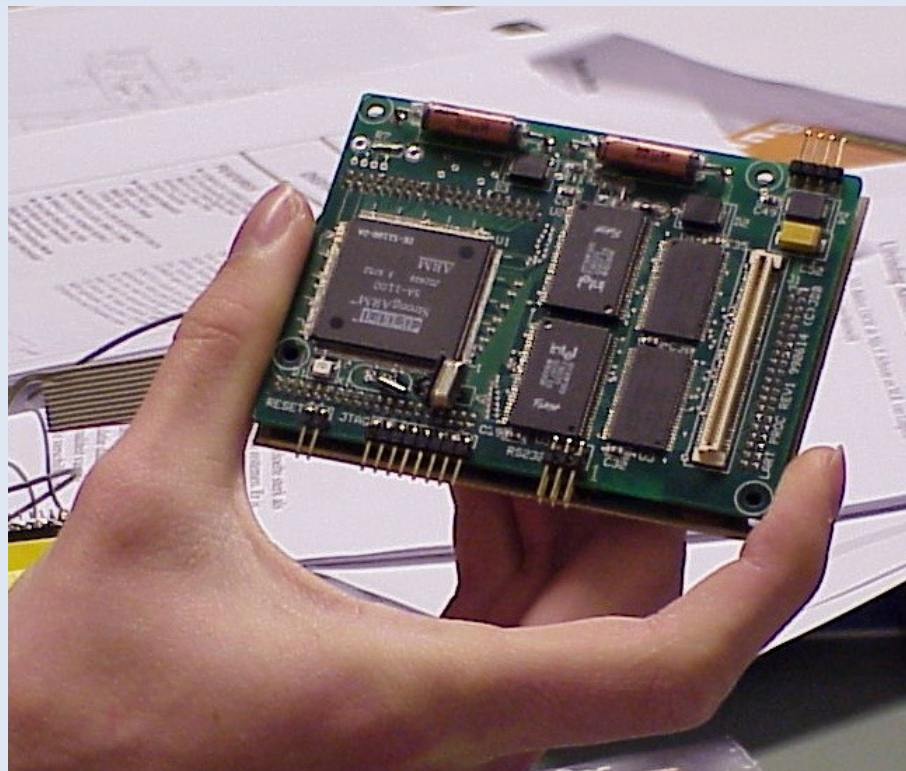
- Open Tools in Science
- Commercial Solutions
 - Limited Operating Systems Supported
 - Price

Open Tools History

- Open Tools in Science
- Commercial Solutions
 - Limited Operating Systems Supported
 - Price
 - Features/Fixes

Open Tools History

- Open Tools in Science
- Commercial Solutions
- LART Project

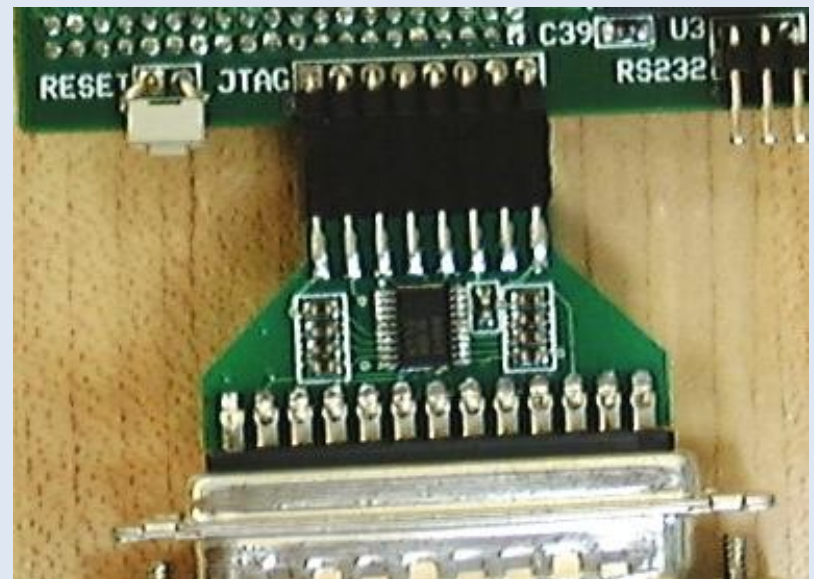


Open Tools History

- Open Tools in Science
- Commercial Solutions
- LART Project
 - Open Platform

Open Tools History

- Open Tools in Science
- Commercial Solutions
- LART Project
 - Open Platform
 - JTAG – Holly Gates Dongle



Open Tools History

- Open Tools in Science
- Commercial Solutions
- LART Project
 - Open Platform
 - JTAG – Holly Gates Dongle
 - Linux + Open Hardware + Open Tools

Open Hardware Solutions

The Maker/Hacker Community
has changed the way people
create hardware and software solutions



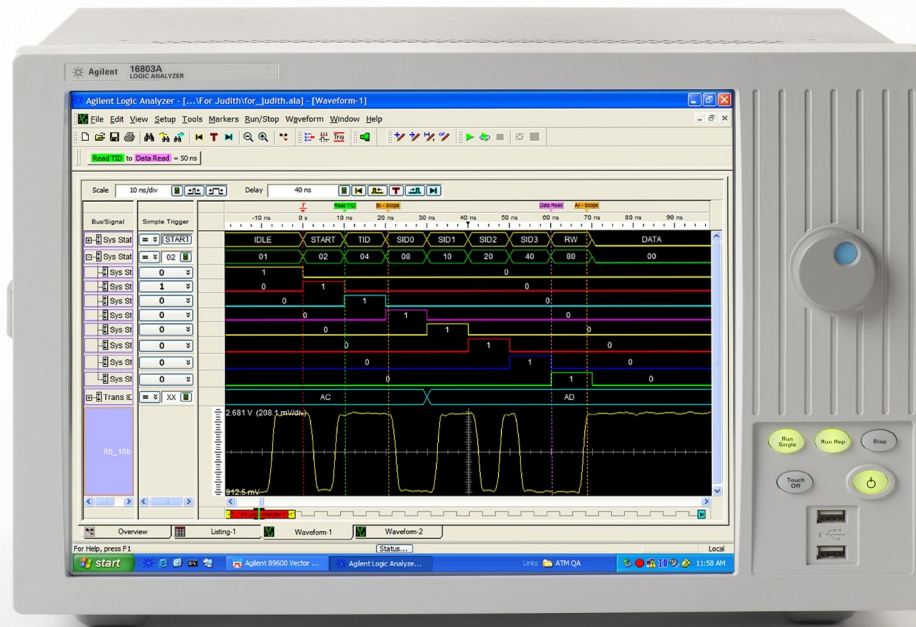
Open Hardware Solutions

A good multimeter used to be enough!



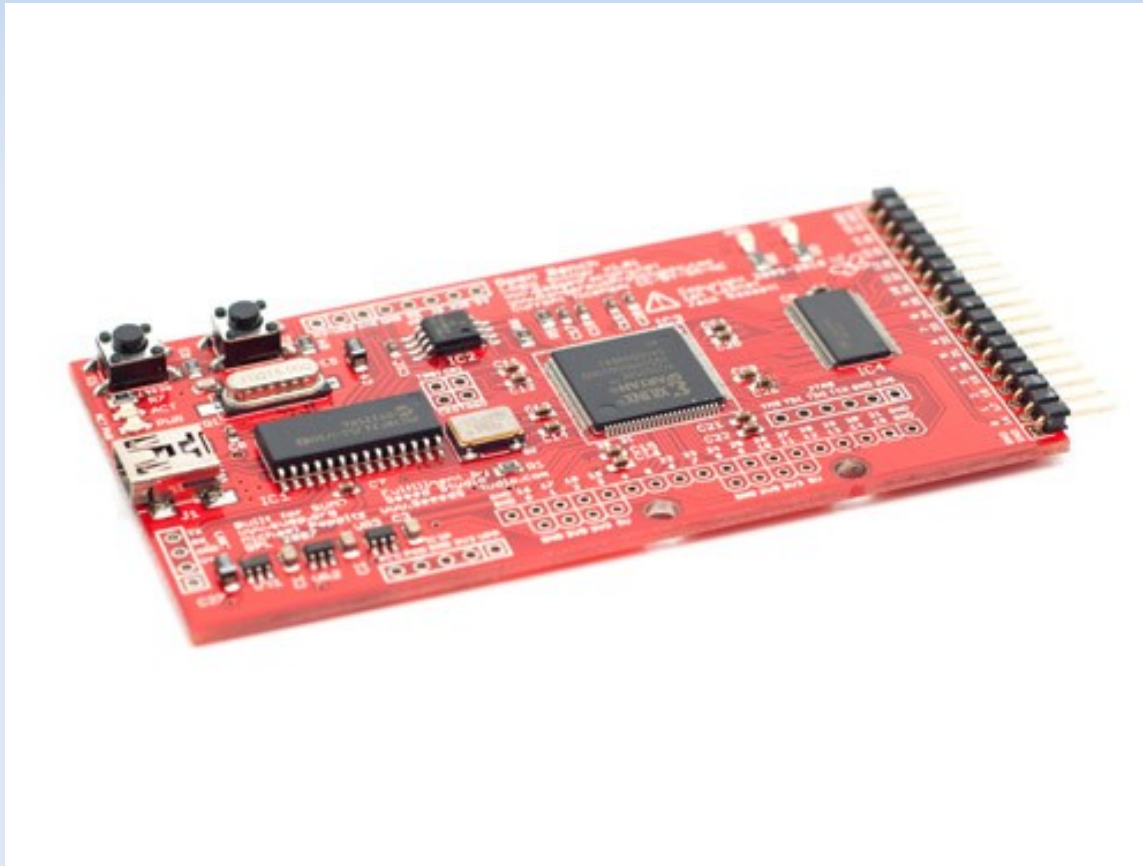
Open Hardware Solutions

- Logic Analyzers



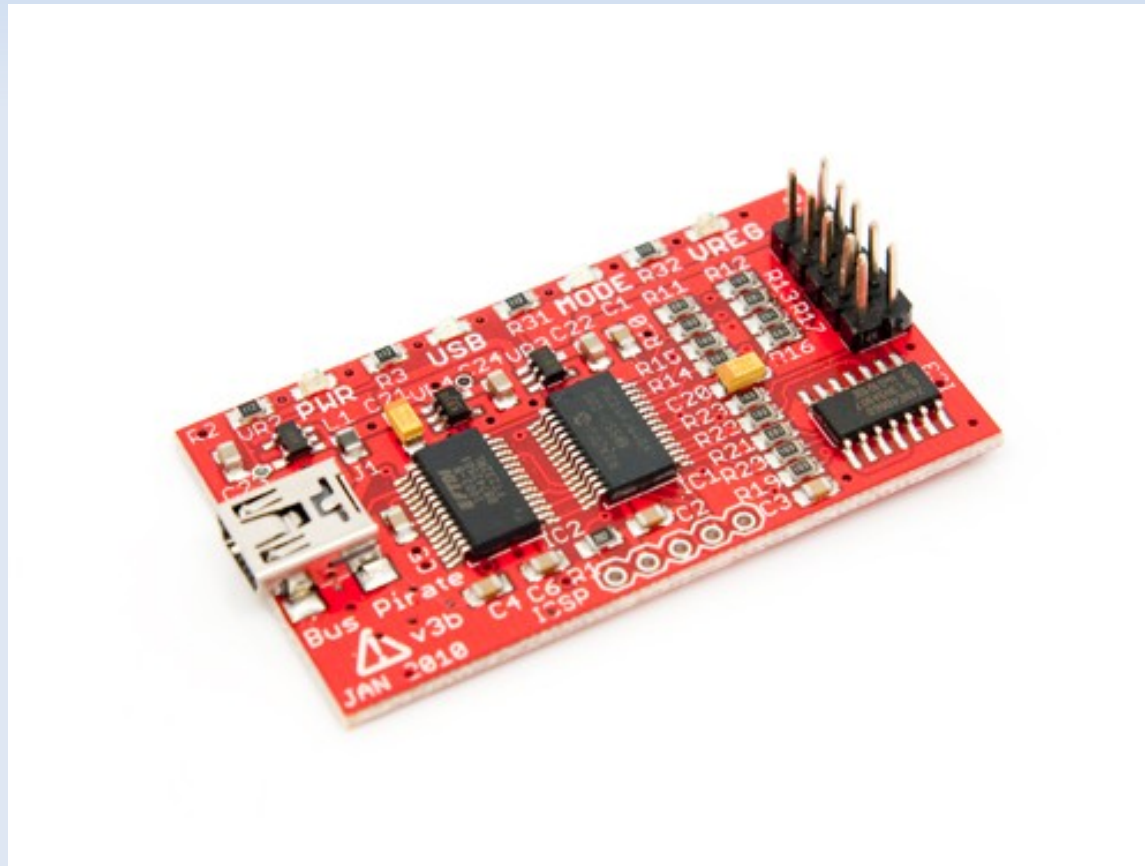
Open Hardware Solutions

- Logic Analyzers
 - Open Workbench Logic Sniffer



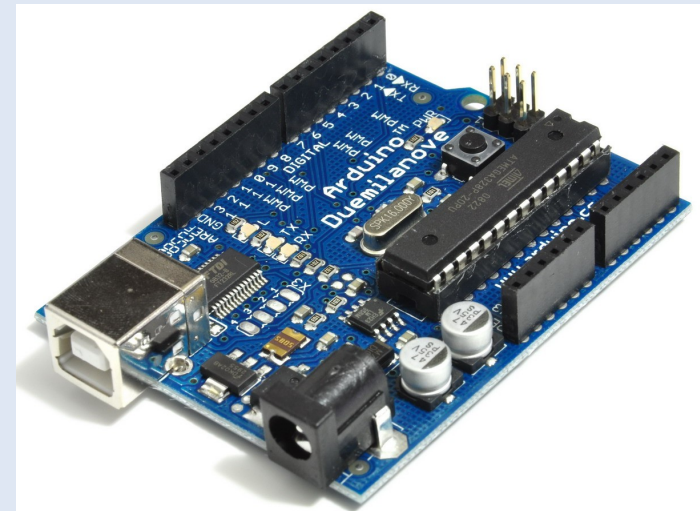
Open Hardware Solutions

- Logic Analyzers
 - Open Workbench Logic Sniffer
 - Bus Pirate



Open Hardware Solutions

- Logic Analyzers
 - Open Workbench Logic Sniffer
 - Bus Pirate
 - AVR/Arduino (Insert Arduino Jokes Here)



Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes



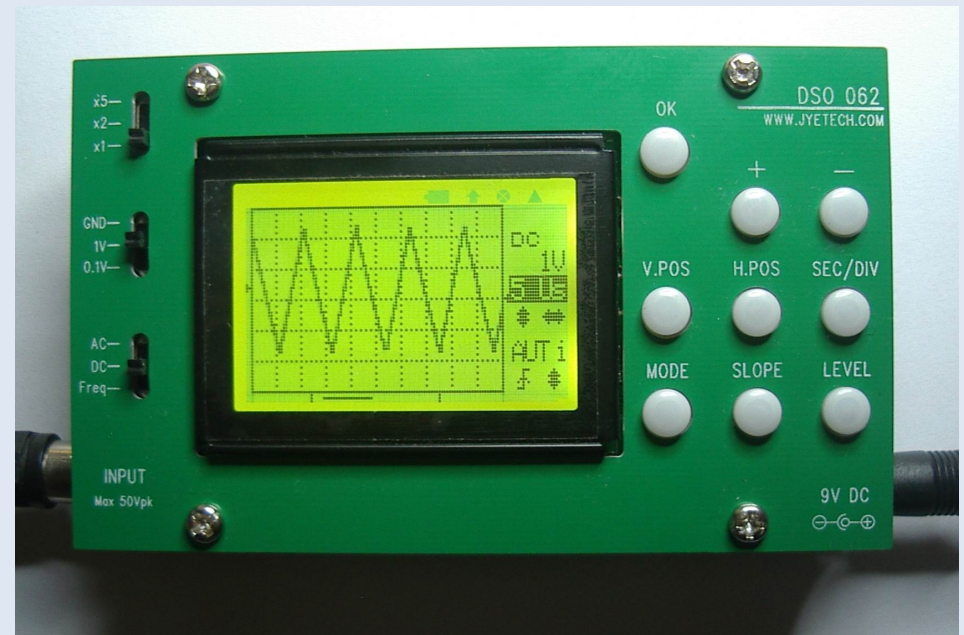
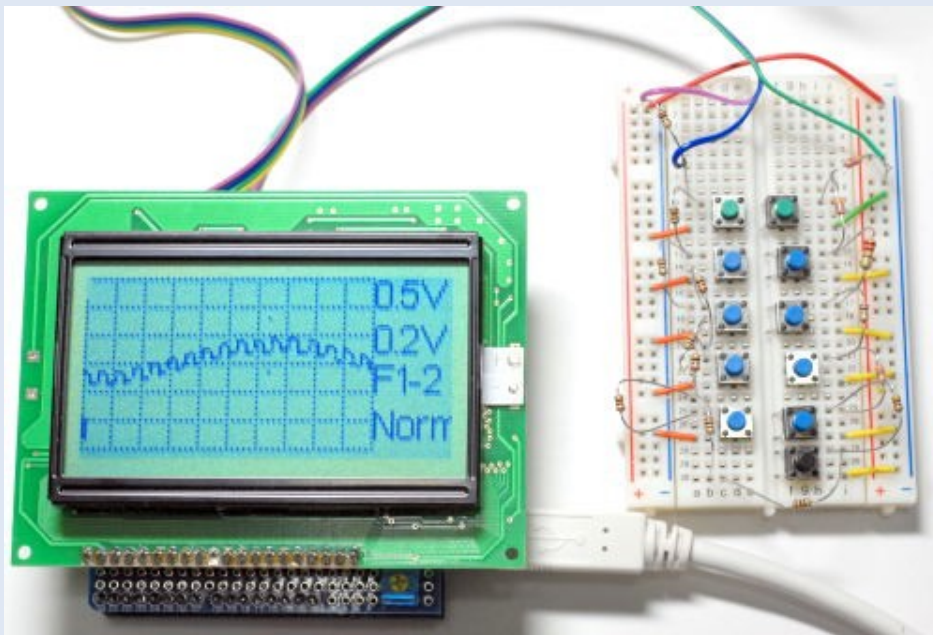
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
 - Nano-DSO



Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
 - Nano-DSO
 - AVR and Arduino (Insert More Arduino Jokes here)



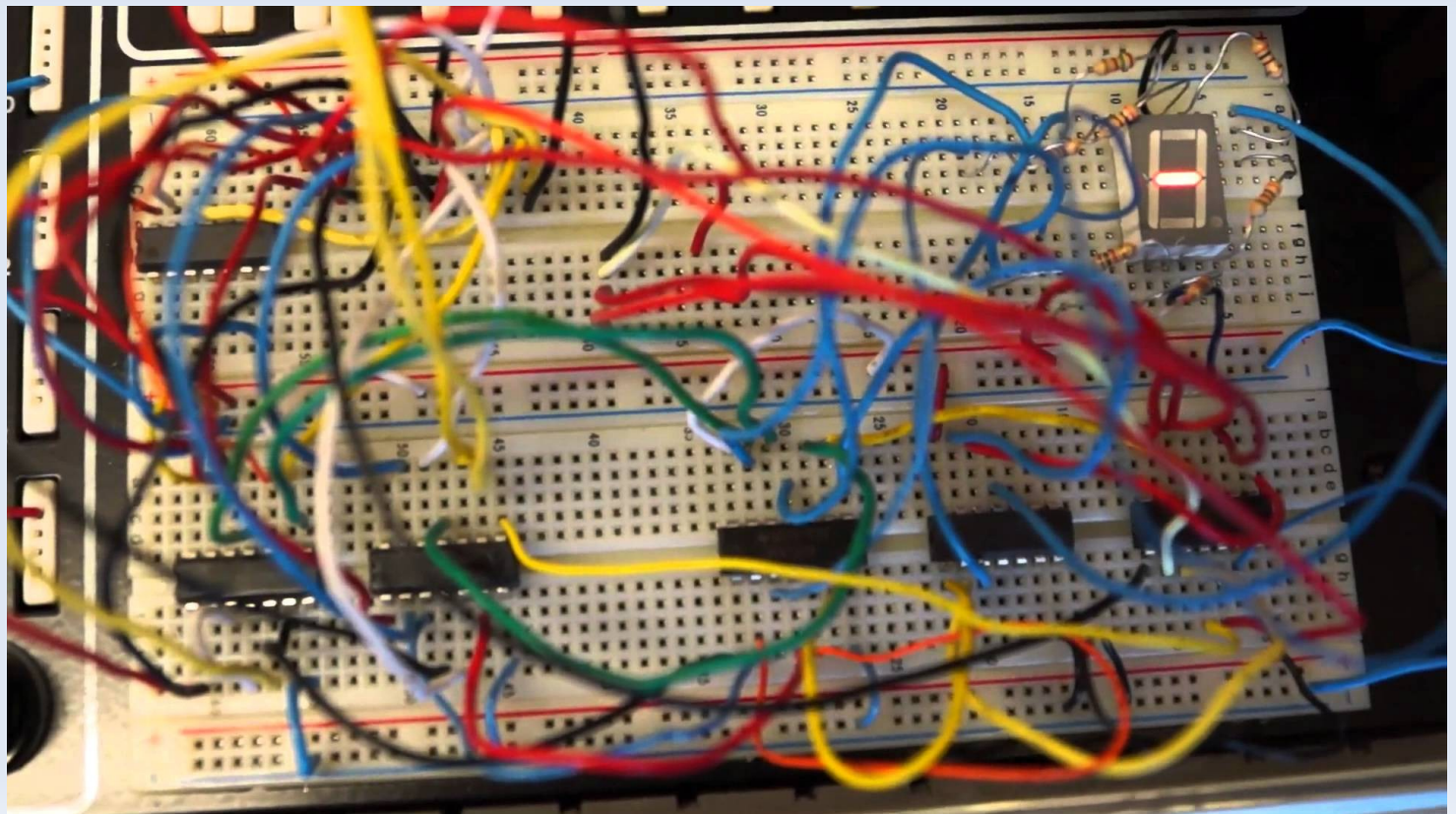
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
 - Nano-DSO
 - AVR and Arduino
 - PIC Based



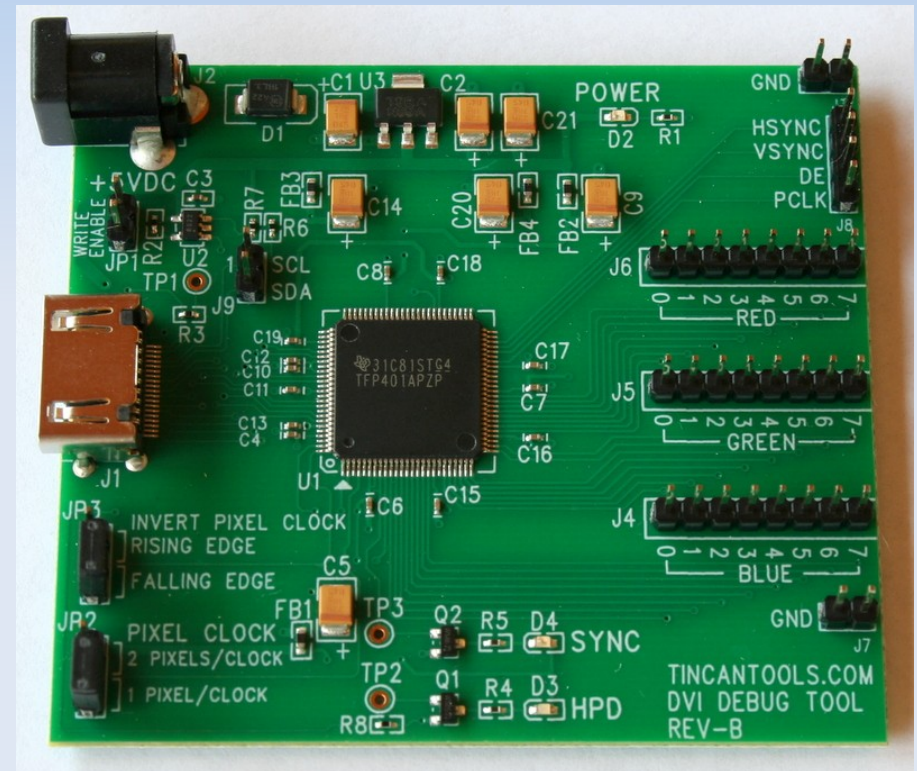
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
- Custom Solutions



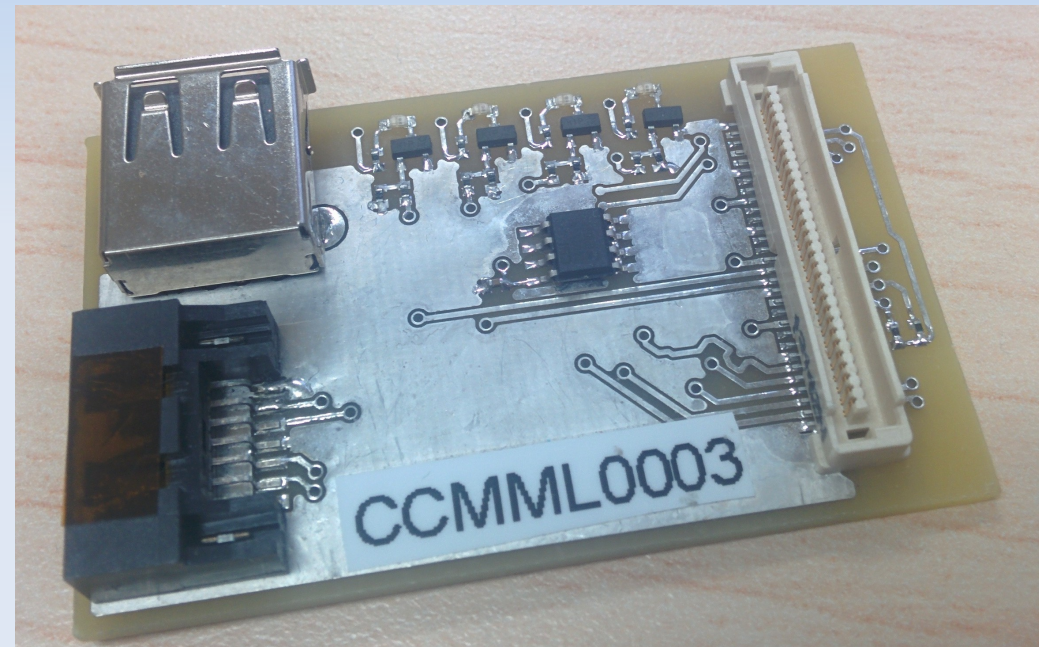
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
- Custom Solutions
 - Off-the-Shelf Solutions



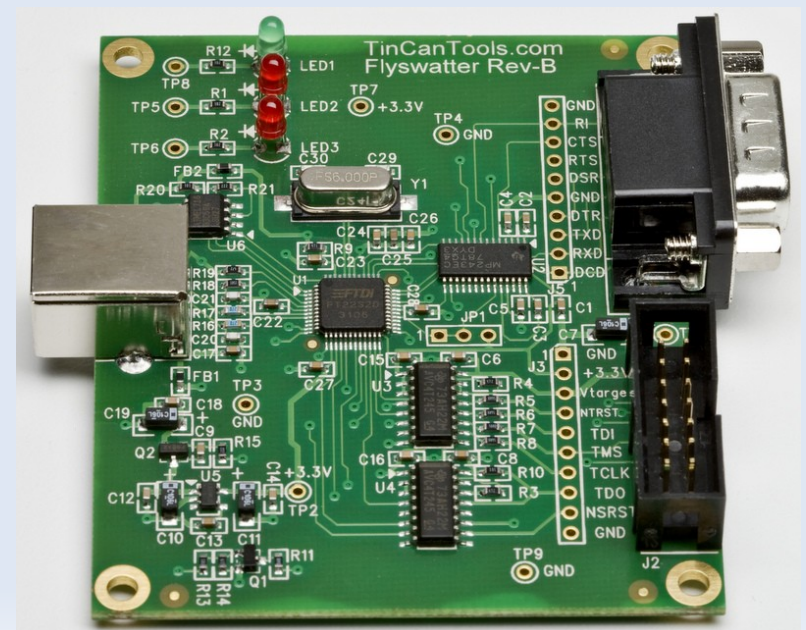
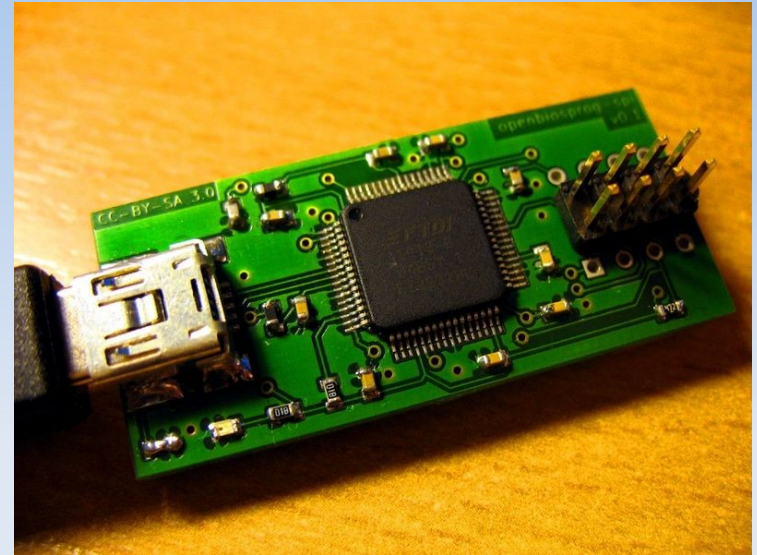
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
- Custom Solutions
 - Off-the-Shelf Solutions
 - Common Interfaces



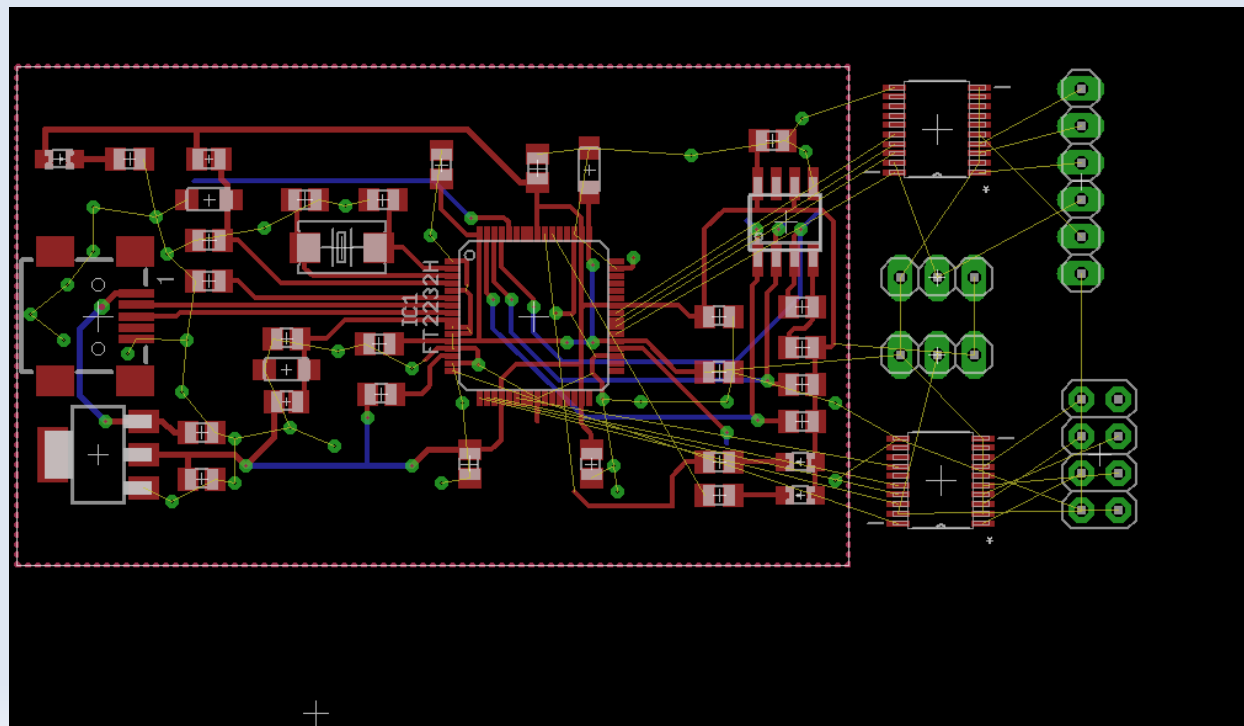
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
- Custom Solutions
 - Off-the-Shelf Solutions
 - Common Interfaces
 - Shared tool
 - Flashrom
 - Openocd



Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
- Custom Solutions
- Creating Your Own!



Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
- Custom Solutions
- Creating Your Own!
 - KiCad



Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
- Custom Solutions
- Creating Your Own!
 - KiCad
 - Eagle CAD



Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
- Custom Solutions
- Creating Your Own!
 - KiCad
 - Eagle CAD
 - License it!

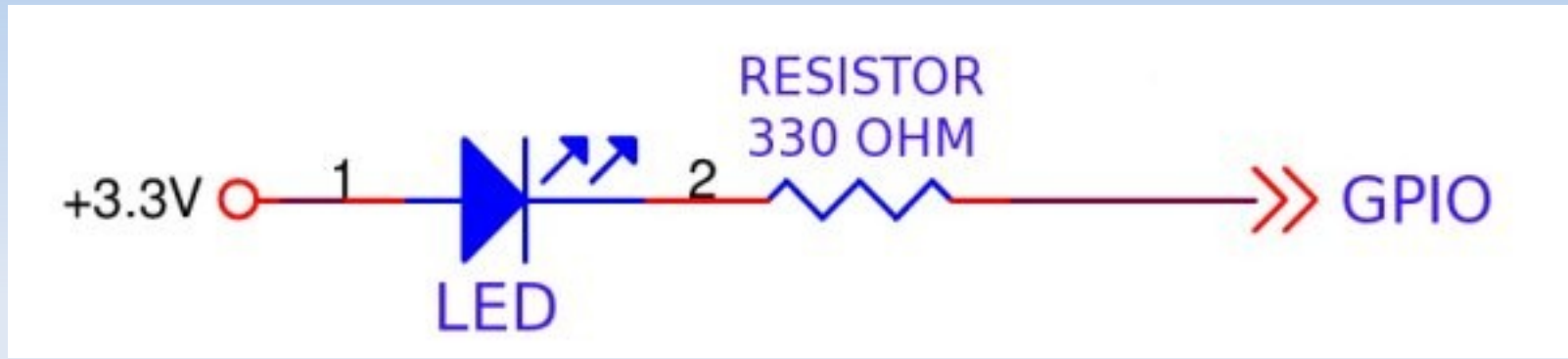


Challenges Going Forward

- Simple User Display

Challenges Going Forward

- Simple User Display



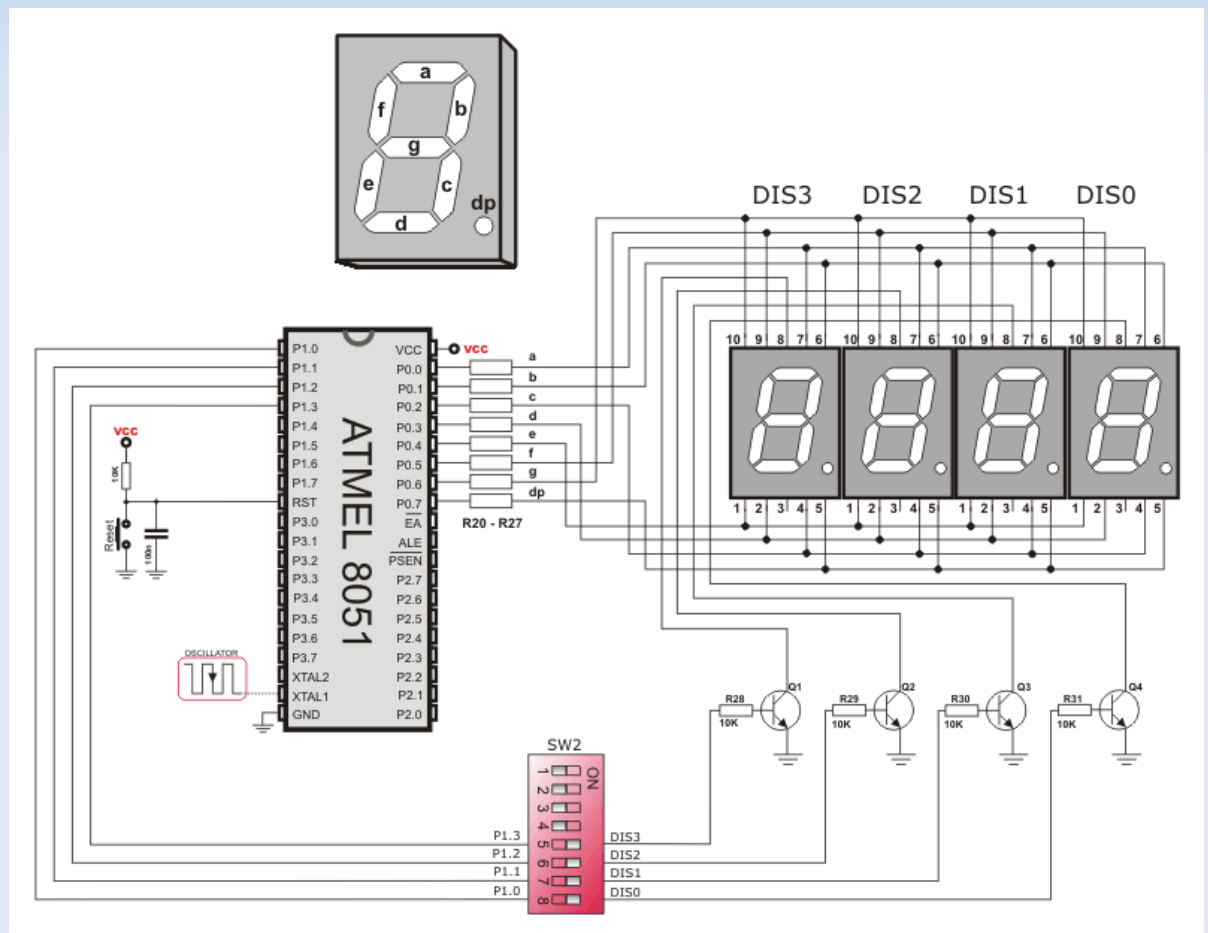
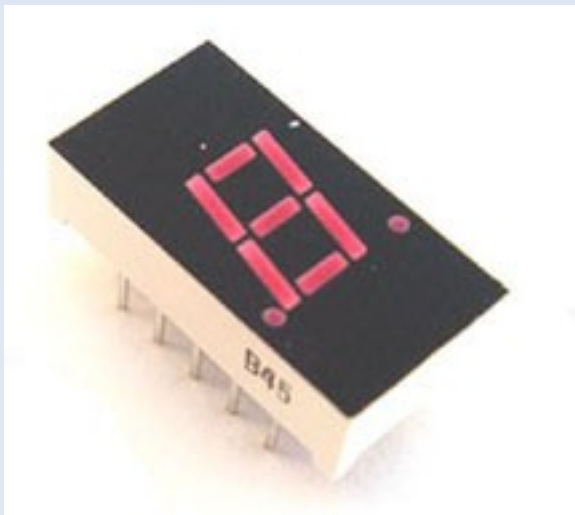
Challenges Going Forward

- Simple User Display
 - Easy to visualize
 - Easy to measure
 - Easy to program



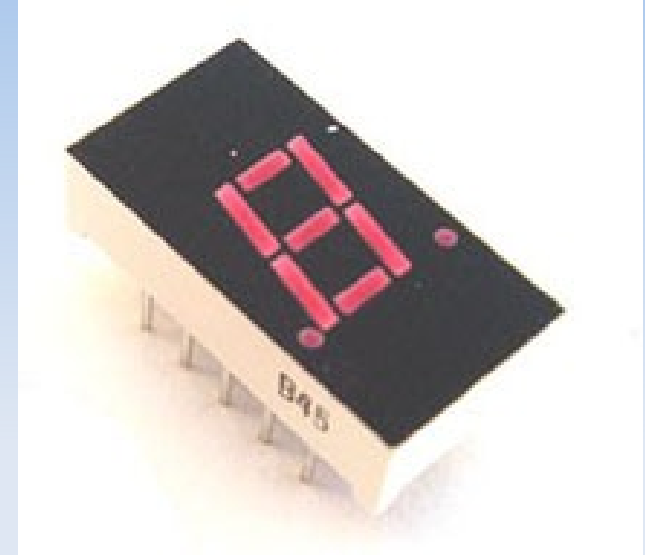
Challenges Going Forward

- Simple User Display
- Evolution of Displays



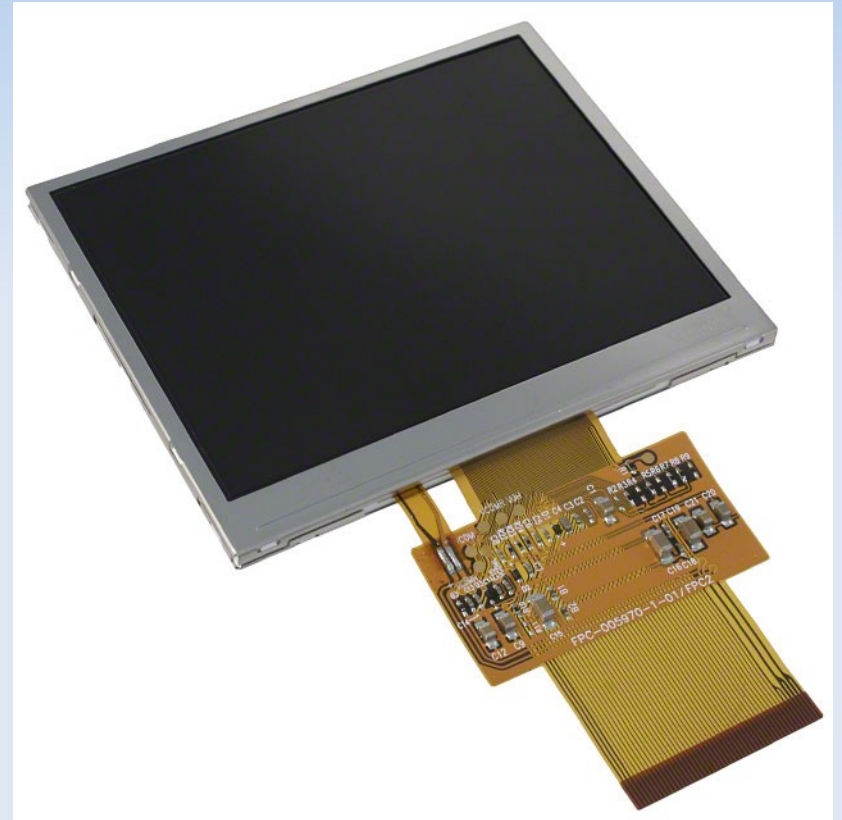
Challenges Going Forward

- Simple User Display
- Evolution of Displays
 - Clocking
 - Multiple signals
 - Introduction of controllers



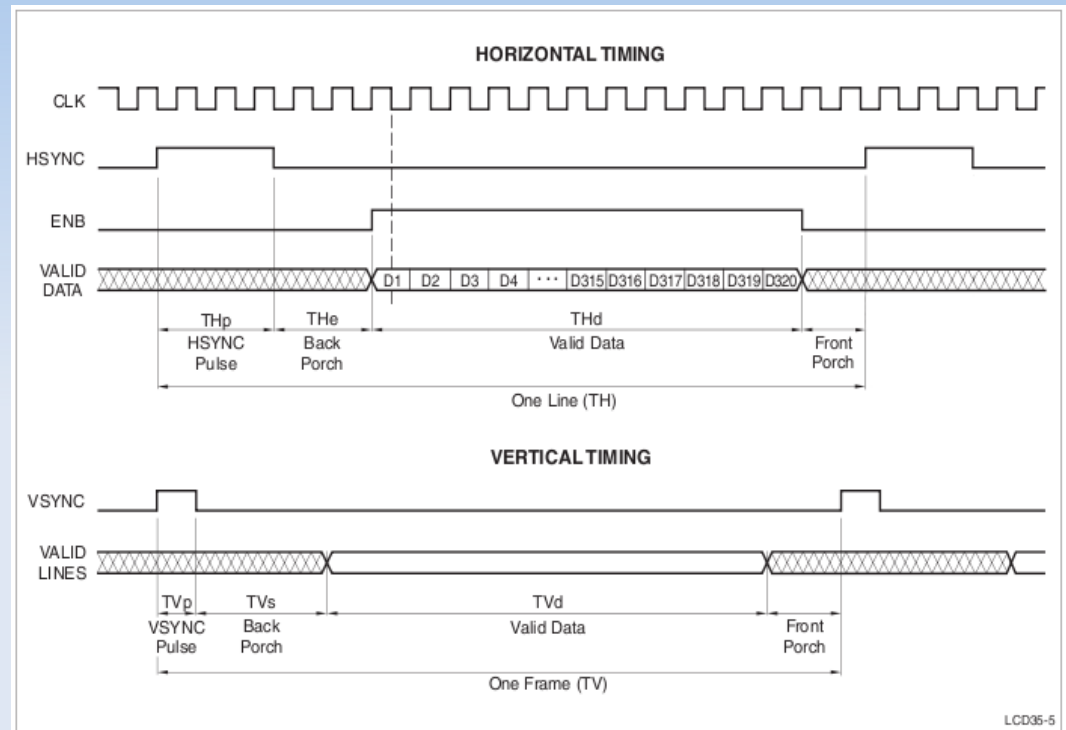
Challenges Going Forward

- Simple User Display
- Evolution of Displays
- Transition to LCD



Challenges Going Forward

- Simple User Display
- Evolution of Displays
- Transition to LCD
 - Higher frequency
 - More signals
 - Complex Controllers

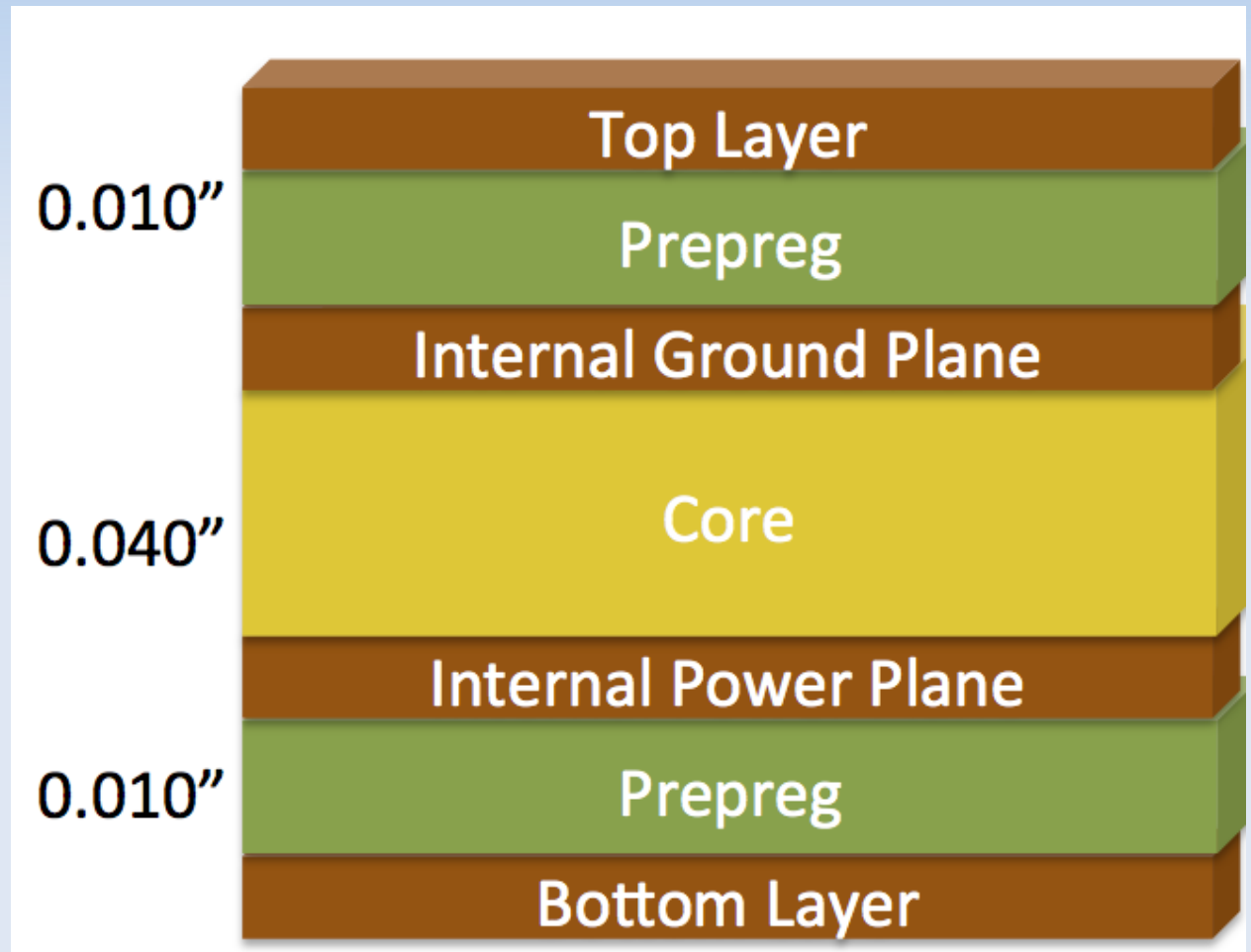


Challenges Going Forward

- Design Constraints

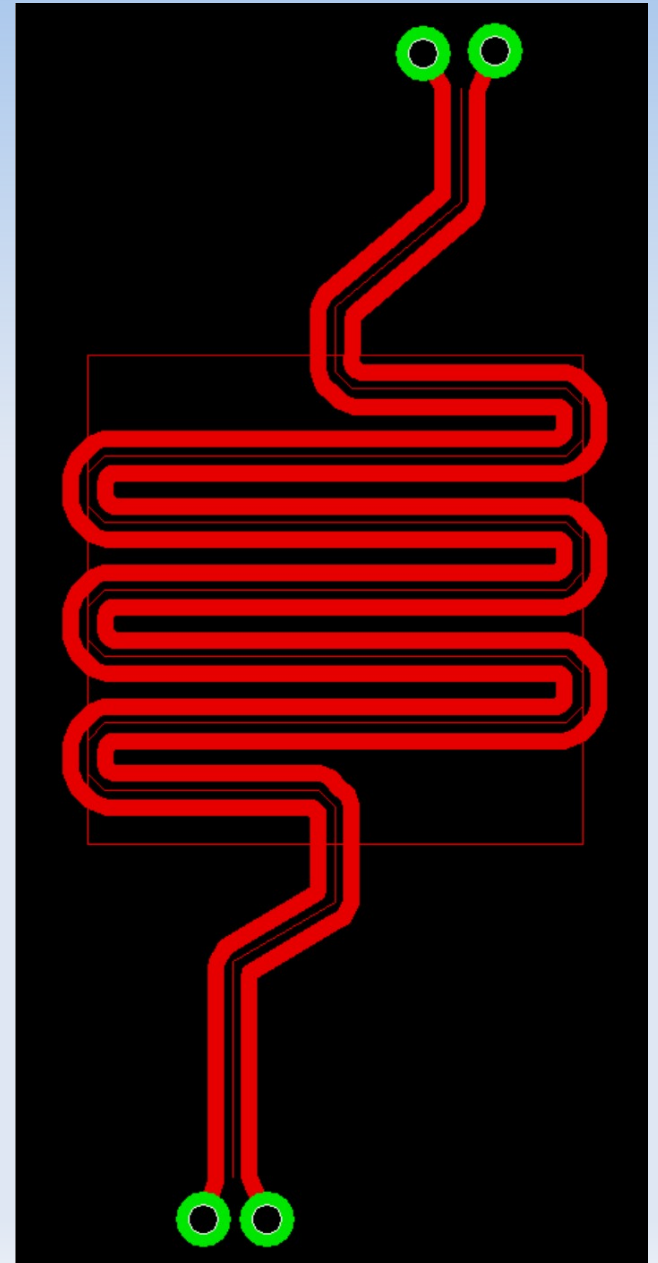
Challenges Going Forward

- Design Constraints
 - Multi-Layer 4+



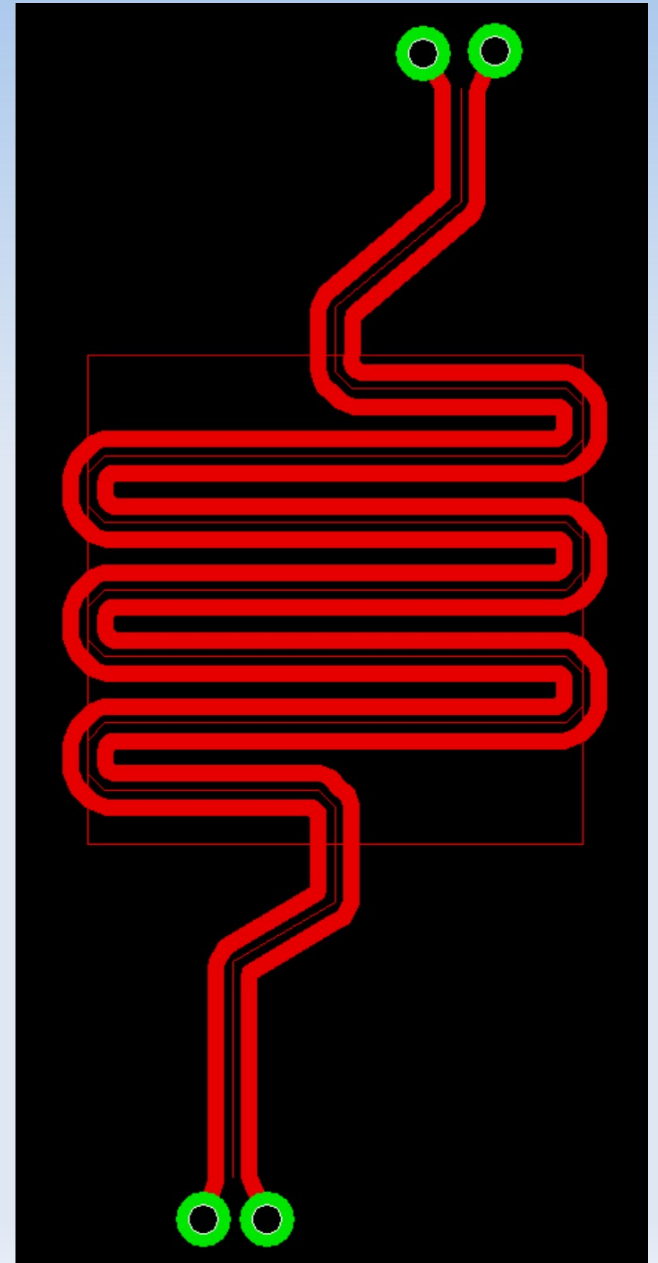
Challenges Going Forward

- Design Constraints
 - Multi-Layer 4+
 - Matched Lengths



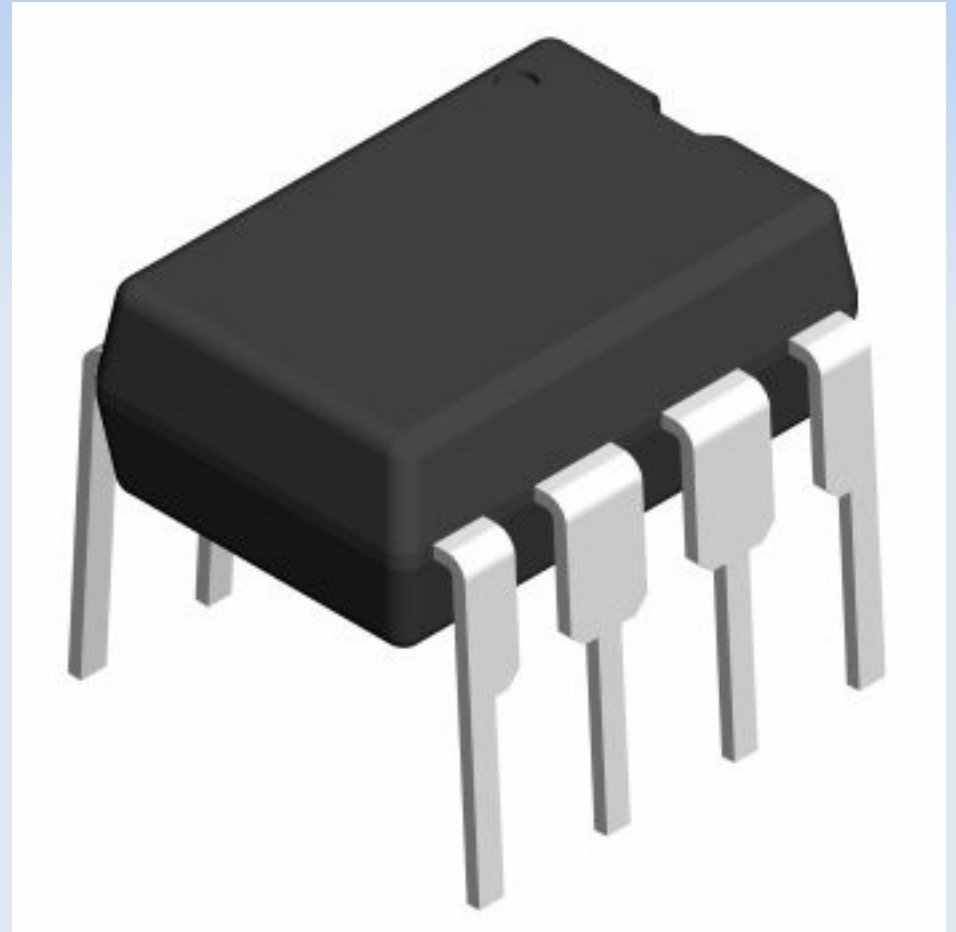
Challenges Going Forward

- Design Constraints
 - Multi-Layer 4+
 - Matched Lengths
 - Matched Impedence



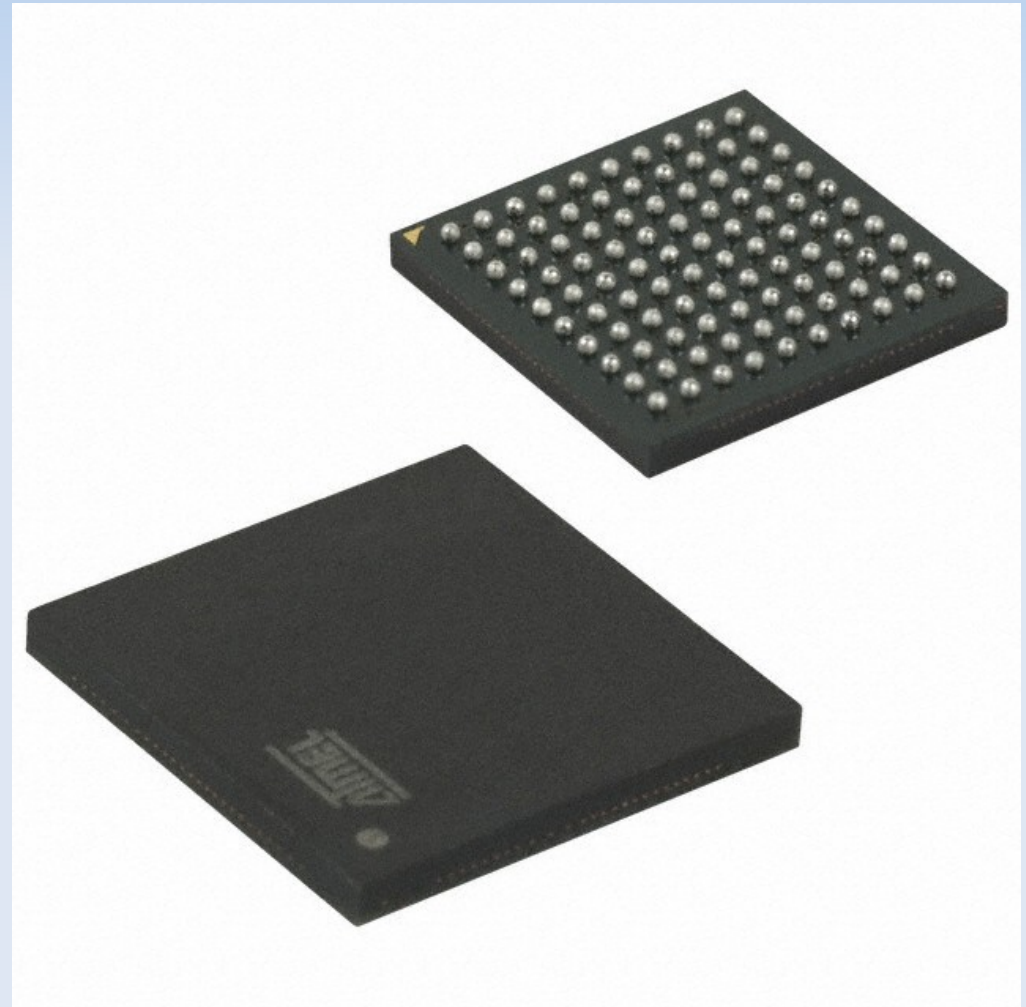
Challenges Going Forward

- Design Constraints
 - Multi-Layer 4+
 - Matched Lengths
 - Matched Impedence
 - Package type



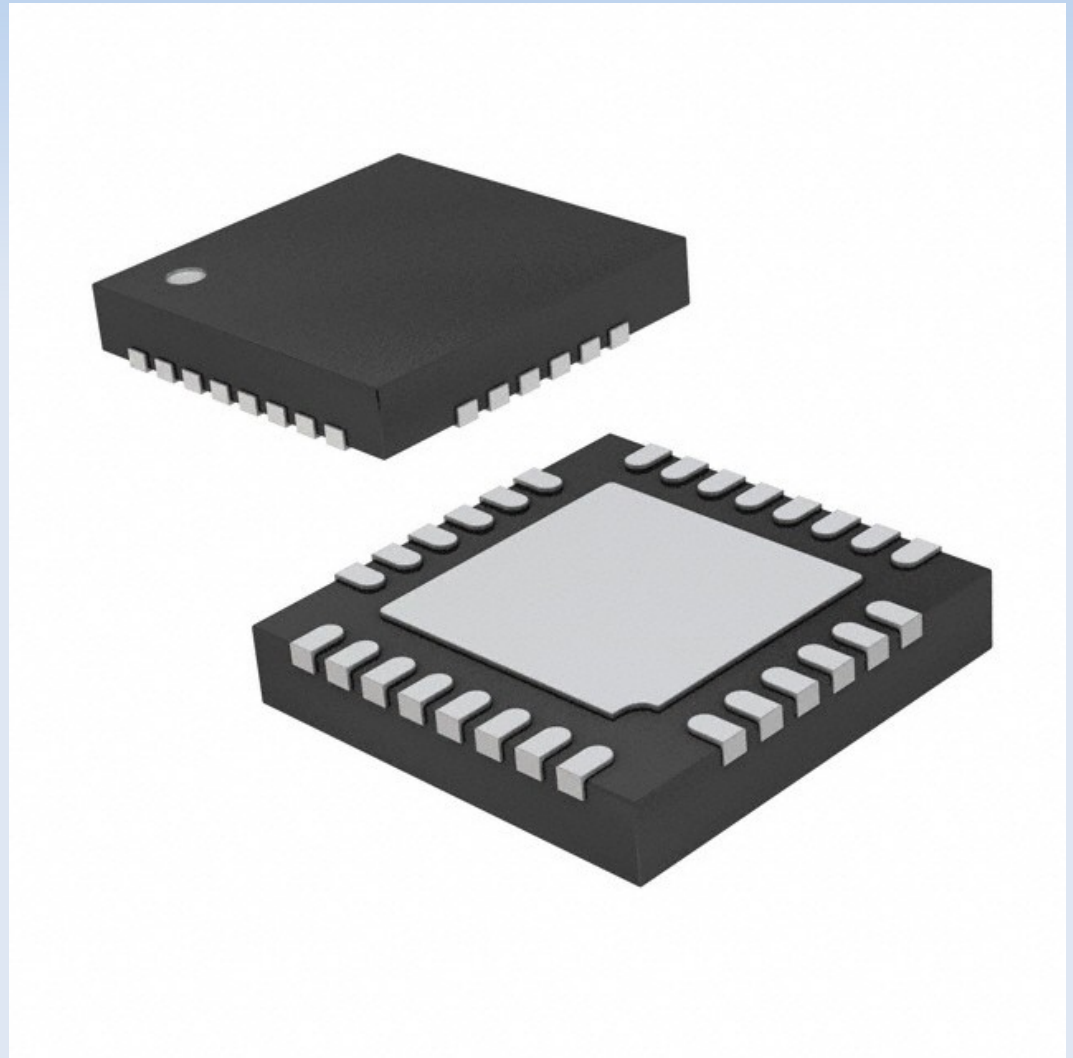
Challenges Going Forward

- Design Constraints
 - Multi-Layer 4+
 - Matched Lengths
 - Matched Impedence
 - Package type
 - BGA



Challenges Going Forward

- Design Constraints
 - Multi-Layer 4+
 - Matched Lengths
 - Matched Impedence
 - Package type
 - BGA
 - QFN

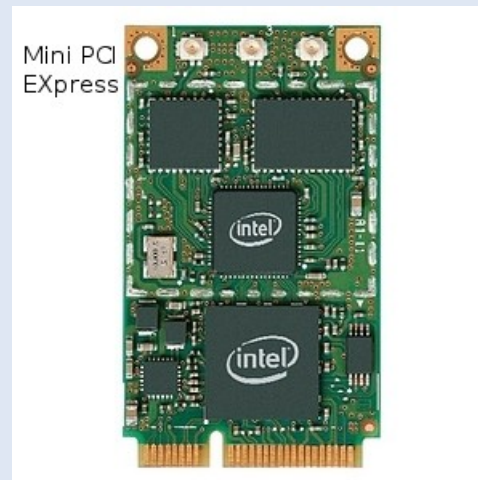
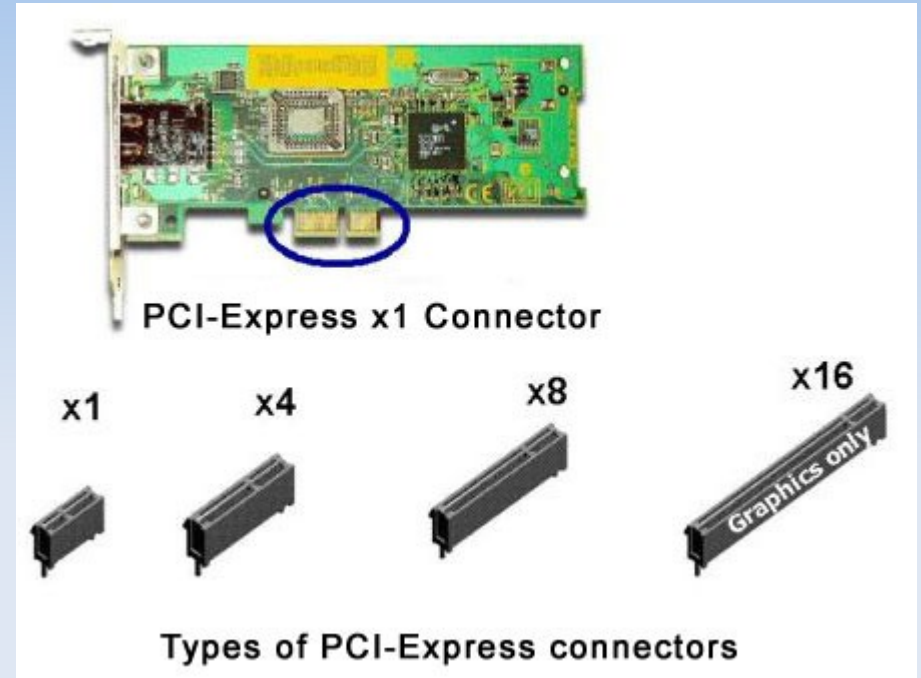


Challenges Going Forward

- Design Constraints
- FPGA

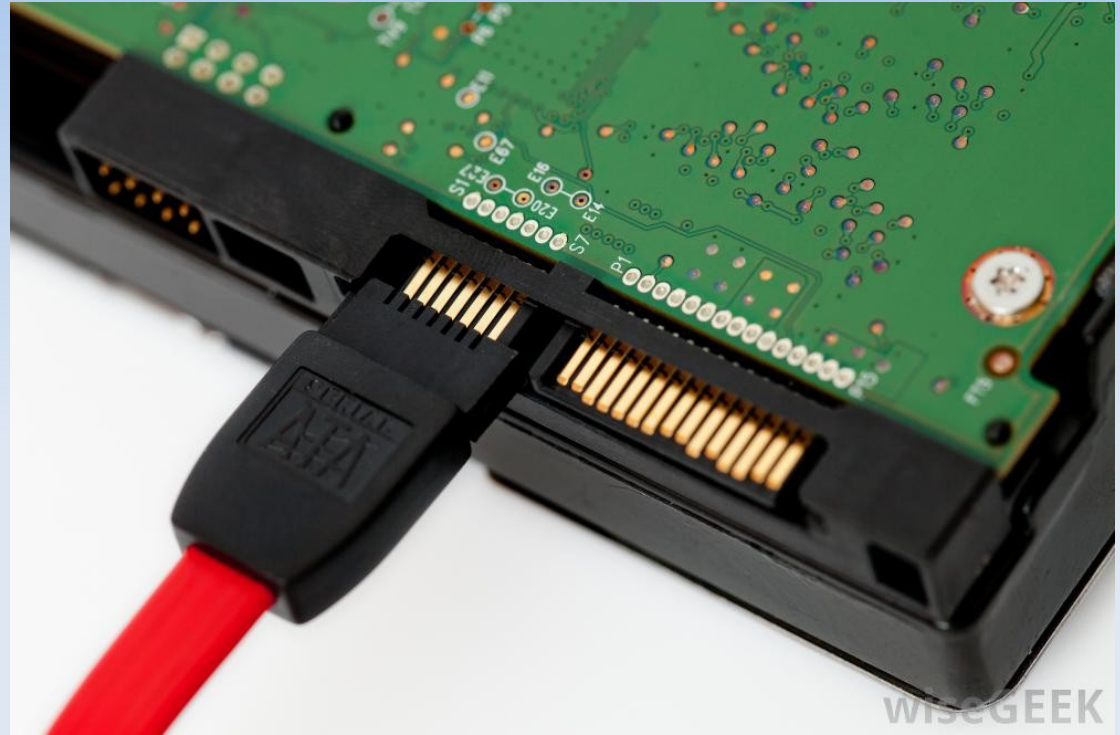
Challenges Going Forward

- Design Constraints
- FPGA
 - PCIe/mPCIe



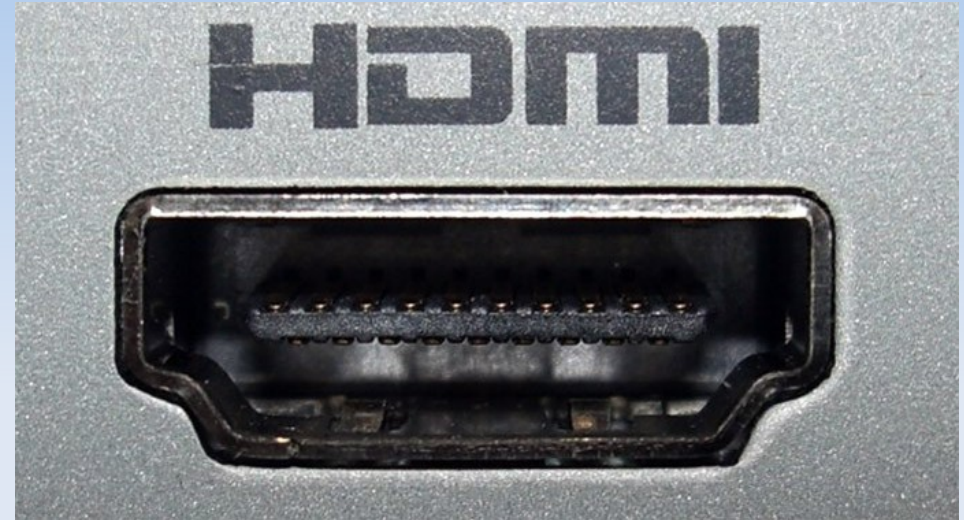
Challenges Going Forward

- Design Constraints
- FPGA
 - PCIe/mPCIe
 - SATA/mSATA



Challenges Going Forward

- Design Constraints
- FPGA
 - PCIe/mPCIe
 - SATA/mSATA
 - HDMI/DisplayPort



Challenges Going Forward

- Design Constraints
- FPGA
- Documentation/Licenses

Challenges Going Forward

- Design Constraints
- FPGA
- Documentation/Licenses
 - Closed or NDA Documents



Challenges Going Forward

- Design Constraints
- FPGA
- Documentation/Licenses
 - Closed or NDA Documents
 - Restrictive License



Challenges Going Forward

- Design Constraints
- FPGA
- Documentation/Licenses
 - Closed or NDA Documents
 - Restrictive License
 - DRM



Conclusion

- Long History of Open Tools (Past)

Conclusion

- Long History of Open Tools (Past)
- Creating New Open Hardware Tools (Present)

Conclusion

- Long History of Open Tools (Past)
- Creating New Open Hardware Tools (Present)
- Challenges Ahead (Future)

Conclusion

- Long History of Open Tools (Past)
- Creating New Open Hardware Tools (Present)
- Challenges Ahead (Future)
- Incentive to create Open Hardware Tools

Conclusion

- Long History of Open Tools (Past)
- Creating New Open Hardware Tools (Present)
- Challenges Ahead (Future)
- Incentive to create Open Hardware Tools
- Incentive to use Open Hardware Tools

Conclusion

- Long History of Open Tools (Past)
- Creating New Open Hardware Tools (Present)
- Challenges Ahead (Future)
- Incentive to create Open Hardware Tools
- Incentive to use Open Hardware Tools
- Documentation

http://www.elinux.org/Open_tools

Conclusion

Questions?